

WHAT IS CLAIMED:

1. A purified and isolated polynucleotide selected from the group consisting of:
 - (a) a polynucleotide encoding a polypeptide having an amino acid sequence of SEQ ID NO: 2.
 - (b) a polynucleotide which is complementary to the polynucleotide of (a),
 - (c) a polynucleotide representing a naturally occurring mutant or polymorphic form of (a), and
 - (d) a polynucleotide comprising at least 25 nucleotides of the polynucleotide of (a), (b) or (c), said 25 nucleotides being specific for *murD* gene of *Pseudomonas aeruginosa*.
2. The polynucleotide of claim 1 wherein the polynucleotide comprises nucleotides selected from the group consisting of natural, non-natural and modified nucleotides.
3. The polynucleotide of claim 1 wherein the internucleotide linkages are selected from the group consisting of natural and non-natural linkages.
4. The polynucleotide of claim 1 comprising the nucleotide sequence of SEQ ID NO:1.
5. A polynucleotide that is an expression vector comprising a polynucleotide of claim 1.
6. A host cell comprising the expression vector of claim 5.
7. A process for expressing a MurD protein of *Pseudomonas aeruginosa* in a recombinant host cell, comprising:
 - (a) transforming a suitable host cell with an expression vector of claim 5; and,
 - (b) culturing the host cell of step (a) in conditions under which

8. A purified and isolated polypeptide having an amino acid sequence selected from the group consisting of

- (a) a polypeptide having an amino acid sequence of SEQ ID NO:2,
- (b) a polypeptide that is a naturally occurring mutant or polymorphic form of (a).

9. A method of determining whether a candidate compound is an inhibitor of a *Pseudomonas aeruginosa* MurD polypeptide comprising:

- (a) providing at least one host cell harboring an expression vector that includes a polynucleotide selected from the group consisting of:
 - (i) a polynucleotide encoding a polypeptide having an amino acid sequence of SEQ ID NO: 2.
 - (ii) a polynucleotide which is complementary to the polynucleotide of (i),
 - (iii) a polynucleotide representing a naturally occurring mutant or polymorphic form of (i), and
- (b) contacting at least one of said cells with the candidate to permit the interaction of the candidate with the MurD polypeptide, and
- (c) determining whether the candidate is an inhibitor of the MurD polypeptide by ascertaining the relative activity of the polypeptide in the presence of the candidate.

10. The method of claim 9 wherein the polynucleotide has the nucleotide sequence of SEQ ID NO:1.

11. The method of claim 9 wherein in step (c) the relative activity is determined by comparing a measurement of MurD polypeptide activity of at least one cell before step (b) to a measurement of MurD polypeptide activity of at least one cell after step (b).

12. A compound that is an inhibitor of a polypeptide having an amino acid sequence selected from the group consisting of

- (a) a polypeptide having an amino acid sequence of SEQ ID NO:2,
- (b) a polypeptide that is a naturally occurring mutant or

13. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and an inhibitor of a polypeptide having an amino acid sequence selected from the group consisting of

- 5 (a) a polypeptide having an amino acid sequence of SEQ ID NO:2,
(b) a polypeptide that is a naturally occurring mutant or polymorphic form of (a).

14. A method of treatment of a patient in need of prophylactic or
10 therapeutic treatment for a bacterial infection comprising administering to the patient an effective amount of an inhibitor of a polypeptide having an amino acid sequence selected from the group consisting of

- (a) a polypeptide having an amino acid sequence of SEQ ID NO:2,
(b) a polypeptide representing a naturally occurring mutant or
15 polymorphic form of (a).